



THE ROLE OF BIOTECHNOLOGY IN COMBATting HUNGER IN DEVELOPING COUNTRIES

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Good afternoon, Mr. Chairman and Members of the Subcommittee. Thank you for the opportunity to discuss the role of biotechnology in combating hunger and poverty in developing countries.

This is a vitally important topic. Every day, more than 800 hundred million people on this planet go to bed hungry. More than one billion people live in abject poverty, on incomes of less than \$1 per day.

There is no single cause of this misery. Poor education, pests, drought, disease, food distribution problems and civil strife are all in part to blame. But the enormity of the problem cannot stop us from shaping a response. As we search for solutions, we must explore all means available.

In fighting hunger and poverty, modern biotechnology must be part of our arsenal.

In the past several months alone, the news has been filled with indications of the great promise of this technology. Researchers have found ways to enhance the Vitamin A content of rice, promising great strides in the fight against blindness and other diseases around the world. A working draft of the sequence of the human genome has now been mapped, offering tremendous potential in using the science of genetics to help fight disease.

At the same time, we must proceed with wisdom and caution. Biotechnology presents both potential benefits and risks. In the U.S., we have had a strong and effective regulatory system to address environmental and other concerns from biotechnology for many years. As the technology advances, we will continue to refine our regulatory processes. For biotechnology to do the most good for the most people, we must encourage and support credible, science-based regulatory systems around the world.

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Today I will briefly discuss three topics: how biotechnology can contribute to the fight against hunger and poverty; barriers that must be overcome; and U.S. government programs in this area.

HOW BIOTECHNOLOGY CAN CONTRIBUTE

How do we feed a growing population, which some estimate will reach 9 billion in the next 30 years, when most arable land on the planet is already under cultivation?

How do we find new ways to deliver desperately needed medicines to desperately poor people?

Modern biotechnology is part of the answer. Some of the potential benefits of this technology include:

- Enhanced nutritional benefits of common staple foods
- Increased crop yields
- Reduced need for chemical and water inputs
- Increased resistance to crop stress, such as drought
- Smaller losses from spoilage and longer shelf lives
- Increased income generation and rural development
- Medicines and vaccines that are more affordable and accessible

Among the most promising applications of modern biotechnology are those that can enhance the nutritional content of foods. Vitamin A-enriched rice has recently been developed and received much attention; other possibilities include vitamin A-enhanced oil, vitamin A-enhanced tomatoes, and iron-enriched rice. Modern biotechnology can be used to fight the many scourges that accompany malnutrition around the world, including illness, blindness, developmental problems and death.

Some have questioned the need for such products, arguing that poor people need balanced diets, not vitamin-enriched rice. But we should not let the perfect become the enemy of the good. Sadly, access to balanced diets is limited in many countries by poverty, food distribution problems and other complex and entrenched social conditions. Staple foods such as rice may be the only foods available. As we attack all causes of hunger and malnutrition, increasing the nutritional content of staple foods can make a difference in people's lives.

Drought and disease plague developing country farmers around the world. Here, too, modern biotechnology can make a difference. Scientists are exploring ways to make mangoes, cassava, plantains and other tropical crops resistant to drought and virus-borne diseases.

Pests are also a significant barrier to agricultural productivity around the world. By using modern biotechnology, scientists can insert natural pesticides such as Bt into crops, reducing loss due to insect damage. This technology is already helping farmers increase productivity, while reducing pesticide usage, here in the U.S. In the developing world, the technology can help promote food security and increase incomes among poor farmers.

Part of biotechnology's promise is to produce plants that are more productive with fewer inputs (such as chemicals and water). Such applications would reap enormous benefits for poor farmers, who could use their scarce resources to produce crops that would better feed their families while lessening or removing the need to convert new lands to agriculture. And, these applications would help to protect farmers from environmental fluctuations, such as drought. Such vagaries of agriculture have had extremely serious impacts on the poor, as we are seeing right now in parts of Africa, where drought is again taking a terrible toll. The ability to stabilize yields will obviously offer great benefits to U.S. farmers and consumers as well.

An eloquent statement on this topic comes from Florence Wambugu, director of an African agricultural institute with expertise in biotechnology. She wrote last year in *Nature*:

"The African continent, more than any other, urgently needs agricultural biotechnology, including transgenic crops, to improve food production...Africa missed the Green Revolution... Africa cannot afford to be excluded or to miss another major global technological revolution. It must join the biotechnological endeavor."

Biotech pharmaceuticals can also make a difference. Biotechnology is being used to create a variety of medicines, such as new vaccines, anti-cancer drugs and human insulin. Developing countries will benefit by biotechnology's ability to produce a broader range of medicines in a more timely and cost-effective manner. Vaccines for malaria and better treatments for HIV/AIDS may both be on the horizon.

BARRIERS TO THE USE OF MODERN BIOTECHNOLOGY IN THE DEVELOPING WORLD

Nevertheless, there are barriers to the use of modern biotechnology in the developing world. These include:

- Cost
- Adequate regulatory structures
- Lack of knowledge/fear

A threshold issue is cost. To gain the benefits of modern biotechnology, adequate financing must be found. Many experts have noted that, as with many technologies, initial applications have primarily benefited those with purchasing power in wealthier countries. For modern biotechnology to help the poor farmer in developing countries, we must find ways to finance the use of this technology for the farmer's benefit.

Part of the answer to this challenge lies in the public sector. We must find ways to support the work of universities, research institutions and other organizations with expertise in this area. In particular, we must support the Consultative Group on International Agricultural Research, whose work has been instrumental in fighting hunger and poverty for many years.

Part of the answer must be found in the private sector as well. Private companies, of course, often have fiduciary responsibilities to shareholders and have a very different role than public sector institutions or charities. But we must find creative solutions, looking to public-private partnerships and other tools. We must find programs that improve the lives of the poor, promote long-term

acceptance of this technology and help advance the goals of all concerned. One encouraging example of work to date is the collaboration between Monsanto, the U.S. Agency for International Development (USAID) and the Government of Kenya to develop a disease-resistant sweet potato that will likely be among the first genetically-engineered crops tested in Sub Saharan Africa.

A second issue is the need for adequate regulatory structures. Like any new technology, modern biotechnology presents risks that must be managed. Environmental testing is important, for example, to ensure gene transfer issues are addressed. Issues related to pest resistance may be important.

The Clinton Administration is deeply committed to helping developing countries build adequate regulatory systems to manage and address biotechnology. Our commitment is one reason I'm pleased to announce that the Administration strongly supports the major thrust and intent of S. 2106, "Advancing the Global Opportunities for Biotechnology in Agriculture of 2000," introduced by Senator Ashcroft. We look forward to discussions among staff to resolve technical issues and to working together to secure passage of this legislation. The programs described in S. 2106 can help developing countries establish regulatory systems to assess the opportunities and potential risks associated with modern biotechnology.

A final barrier is lack of knowledge and fear. Around the world, we've seen lack of knowledge and fear emerge as major factors in the development of modern biotechnology. In my view, we should neither minimize nor bemoan this important fact: we should recognize and address it. We should work to promote scientific cooperation and reasoned dialogue on this topic. We should recognize that this topic can implicate ethical and religious issues for some. In the long run, modern biotechnology cannot promote a better tomorrow unless people from around the world understand it and have a stake in the technology's future.

HOW THE U.S. IS ADDRESSING THE ISSUE

This Administration is strongly committed to finding ways for modern biotechnology to help fight hunger and poverty. Our work in this area cuts across many agencies, including USAID, the U.S. Department of Agriculture and the Department of State.

USAID spends roughly \$7 million a year on agricultural biotechnology in developing countries. USAID's work emphasizes two aspects: cooperative research and technology development, and the promotion of science-based regulatory systems. Cooperative research and technology development efforts link U.S. universities and companies with research and government institutions in developing countries. It is important that developing countries have the technical and institutional ability to access the potential of biotechnology for themselves. Creating ownership over the technology helps defuse the political issues, and provides the basis for a science-driven regulatory system. In addition, USAID supports the development of biosafety regulatory systems and legal and management policies for addressing intellectual property rights associated with biotechnology.

The Department of Agriculture spends more than \$60 million annually on biotechnology research, providing education programs to current and emerging agricultural biotechnology markets, and on cooperative efforts with researchers in developing countries. The Department of Agriculture has

implemented special programs for a targeted group of developing countries, and it conducts training seminars, which provide a balanced view of biotechnology to selected consumer, producer, processor, trader or regulator representatives. In addition, the Department of Agriculture directs efforts toward educating regulators and journalists on the science-based regulatory process practiced in the U.S. for biotech crops and products, and it brings interested stakeholders for U.S.-based training. The Agricultural Research Service of the Department of Agriculture not only conducts its own research into biotechnology, it also manages a germplasm system that shares germplasm freely with developing countries.

For example, the Department of Agriculture recently signed an agreement with Sub-Saharan African countries and Tuskegee University to facilitate technology transfer related to agricultural biotechnology. Over \$280,000 is also spent annually on biotech outreach efforts in developing countries, which includes biosafety symposia on the potential environmental risks of biotechnology. The Department has also implemented special programs for a targeted group of developing countries (including Thailand, Vietnam, Indonesia, Philippines, Malaysia, Chile, Uruguay, South Africa, Mexico, Czech Republic, Romania, Hungary, and Poland). It also conducts training seminars, which provide a balanced view of biotechnology to selected consumer, producer, processor, trader or regulator representatives.

The Department of State is actively engaged as well, helping to promote the beneficial application of this technology through many channels. Our Public Diplomacy and Public Affairs Bureau has been working hard organizing speaker programs, digital video conferences, an international visitors program, fact sheets on U.S. agricultural biotechnology regulatory processes for Embassy distribution, and multiple websites, including an electronic journal. To enhance information-sharing efforts, the Department of State recently allocated \$360,000 toward assisting with the effective implementation of the Biosafety Clearing House. This web-based database of information concerning living modified organisms, provides a means for sharing scientific and regulatory information among countries.

The issue of biotechnology in developing countries involves questions of trade, and our Economic Bureau has been proactively addressing this issue through multiple international mechanisms. These include the establishment of a U.S.-EU Consultative Forum on biotechnology, and the Secretary's Advisory Committee on International Economic Policy Working Group on Biotechnology. Our Economic Bureau is also working to ensure that current discussions of biotechnology in international negotiations, such as the recent Organization for Economic Cooperation and Development discussions, are driven by science.

CONCLUSION

Modern biotechnology is not a panacea, but it can help make a difference in the fight against hunger and poverty. Using this new technology, we can feed hungry children, raise incomes, fight disease and protect the environment.

But these results are not guaranteed. To realize the full potential of modern biotechnology, we will need wisdom and creativity in the years ahead. We must find ways to overcome obstacles and address concerns.

This country should be proud to be a global leader in this remarkable new technology. In the years ahead, let us pursue a rational and open dialogue on this topic, applying the lessons of science and respecting all points of view. If we do so, we'll leave a better world behind for our children and theirs.

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